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EXAMINER	
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ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/646,405	WANG ET AL.
	Examiner	Art Unit
	Rodney G. McDonald	1753

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 November 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 14-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 14-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 3-6, 8-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tadashi et al. (Japan 10-324969) in view of Ngan (EP 0 840 351).

Regarding claims 1, Tadashi et al. teach a method of depositing metallic layers on a substrate comprising introducing argon gas into a vacuum chamber proximate a metal target. Power is supplied to the metal target and the RF coil in the presence of argon to form a very thin aluminum film on the substrate. After that electric power to the target is stopped and oxygen or nitrogen gas other than argon gas is introduced into the

vacuum chamber and the aluminum film is oxidized or nitrided with the plasma by the RF coil. (See Machine Translation paragraph 0006)

Regarding claims 3, From Fig. 1 the second gas is introduced proximate the upper surface of the substrate. (See Fig. 1; Here oxygen).

Regarding claims 4, power is applied to the target and coil to initiate plasma. (See Machine Translation paragraph 0006)

Regarding claims 5, the second gas can be introduced in a metallic deposition step. The reactant gas is introduced simultaneously for reactant sputtering. (See Machine Translation paragraph 0006)

Regarding claim 6, the first gas argon is introduced in a gas stabilization step. (See Machine Translation paragraph 0006)

Regarding claim 8, the first gas is argon. (See Machine Translation paragraph 0006)

Regarding claim 9, the second gas can be nitrogen. (See Machine Translation paragraph 0006)

Regarding claim 10, the first gas is the inert gas argon. (See Machine Translation 0006)

Regarding claim 11, the second gas is an active gas such as oxygen or nitrogen. (See Machine Translation 0006)

Regarding claim 12, the second gas is introduced after power has been applied to the target and the coil. (See Machine Translation 0006)

The differences not yet discussed are where the target is made of titanium, tantalum or tungsten (Claim 1) and where the coil is made of titanium, tantalum and tungsten (Claim 14).

Regarding claims 1 and 14, Ngan teach utilizing a target and coil made of titanium. (Column 12 lines 40-43)

The motivation for utilizing a target and coil made of a material such as titanium is that it allows for depositing a layer more uniformly. (Column 9 lines 5-8)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Tadashi et al. by utilizing a target and coil made of titanium as taught by Ngan because it allows for depositing a layer more uniformly.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over 1, 3-6, 8-12 and 14 as applied to claims Tadashi et al. in view Ngan above, and further in view of Maniv et al. (U.S. Pat. 4,392,931).

The difference not yet discussed is biasing the substrate (Claim 2).

Regarding claim 2, Maniv et al. teach utilizing RF energy applied to the substrate to cause transparencies of oxide films to be increased. (Column 3 lines 43-59)

The motivation for utilizing an RF bias to the substrate is that it allows for increasing transparencies of the deposited film. (Column 3 lines 43-59)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized an Rf bias to the substrate because it allows for increasing the transparency of the film.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over 1, 3-6, 8-12 and 14 as applied to claims Tadashi et al. in view Ngan above, and further in view of Lantsman (U.S. Pat. 5,830,330).

The difference not yet discussed is the ramping of the power to the target and coil. (Claim 7)

Regarding claim 7, Lantsman teach in Fig. 3 ramping the power to the target and coil to perform sputtering. (See Fig. 3)

The motivation for ramping the powers to the coil and target is that it allows for sustaining the plasma at low pressures. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have ramped the power to the coil and target as taught by Lantsman because it allows for sustaining the plasma at low pressures.

Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over 1, 3-6, 8-12 and 14 as applied to claims Tadashi et al. in view Ngan above, and further in view of Sone (U.S. Pat. 6,451,184).

The differences not yet discussed is where the first gas creates a higher partial pressure of first gas proximate to the sputtering target than at the upper surface of the substrate (Claim 15) and where the second gas creates a higher partial pressure of second gas proximate to the surface of the substrate than at the upper surface of the target (Claim 16).

Regarding claims 15 and 16, since Tadashi et al. teach locating the argon proximate the target in Fig. 1 and locating the oxygen gas proximate the substrate in

Fig. 1 the apparatus would have inherently higher partial pressures of argon proximate the target and higher partial pressures of oxygen proximate the substrate. (See Fig. 1) Sone further teaches partitioning the gas space such that reactive gas is contained between the partition member and the substrate and the sputter gas is maintained between the target and the partition member. This keeps the partial pressure of reactive gas higher at the substrate surface than at the target surface and keeps the partial pressure of argon gas higher at the target surface than at the substrate surface. (See Abstract) Furthermore, Sone recognizes that the prior art has attempted to keep the sputtering gas confined to the target and the reactive gas confined to the substrate. (Column 2 lines 17-22)

The motivation for utilizing a high sputtering gas pressure at the target and a higher reactive gas pressure at the substrate is that it allows for production of compound films with in-plane uniform thickness and optical and electrical characteristics. (Column 3 lines 22-25)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a high sputtering gas pressure at the target and a higher reactive gas pressure at the substrate as taught by Sone because it allows for production of compound films with in-plane uniform thickness and optical and electrical.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over 1, 3-6, 8-12 and 14 as applied to claims Tadashi et al. in view Ngan above, and further in view of Gilboa et al. (U.S. Pat. 5,108,569).

The differences not yet discussed is the use of a shield ring and shield support member.

Regarding claim 17, Gilboa et al. teach a shield ring and shield support member in Fig. 2 such that when the shield ring is supported by the substrate support member a gas can be introduced to the upper surface of the substrate. (See Gilboa et al. Fig. 2)

The motivation for utilizing a shield ring and shield support member is that it allows for clamping the wafer to the substrate support. (Column 8 lines 37-38)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a shield ring and support member as taught by Gilboa et al. because it allows for clamping the wafer to the substrate support.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over 1, 3-6, 8-12 and 14 as applied to claims Tadashi et al. in view Ngan above, and further in view of Chikako et al. (Japan 06-041733).

The difference not yet discussed is the introduction of reactive gas through the central portion of the substrate holder.

Regarding claim 18, Chikako et al. teach introducing reactive gas through the center of a substrate holder. (See Abstract; Figure 1)

The motivation introducing the reactive gas through the center of the substrate is that it allows for suppressing reaction products from building up on the surface of the target. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a reactive gas inlet at the center of the

substrate holder as taught by Chikako et al. because it allows for suppressing reaction products from building up on the surface of the target.

Claims 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tadashi et al. (Japan 10-324969) in view of Sone (U.S. Pat. 6,451,184).

Tadashi et al. is discussed above and all is as applies above. (See Tadashi et al. discussed above)

The differences not yet discussed is where the first gas creates a higher partial pressure of first gas proximate to the sputtering target than at the upper surface of the substrate and where the second gas creates a higher partial pressure of second gas proximate to the surface of the substrate than at the upper surface of the target.

Since Tadashi et al. teach locating the argon proximate the target in Fig. 1 and locating the oxygen gas proximate the substrate in Fig. 1 the apparatus would have inherently higher partial pressures of argon proximate the target and higher partial pressures of oxygen proximate the substrate. (See Fig. 1) Sone further teaches partitioning the gas space such that reactive gas is contained between the partition member and the substrate and the sputter gas is maintained between the target and the partition member. This keeps the partial pressure of reactive gas higher at the substrate surface than at the target surface and keeps the partial pressure of argon gas higher at the target surface than at the substrate surface. (See Abstract) Furthermore, Sone recognizes that the prior art has attempted to keep the sputtering gas confined to the target and the reactive gas confined to the substrate. (Column 2 lines 17-22)

The motivation for utilizing a high sputtering gas pressure at the target and a higher reactive gas pressure at the substrate is that it allows for production of compound films with in-plane uniform thickness and optical and electrical characteristics. (Column 3 lines 22-25)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Tadashi et al. by utilizing a high sputtering gas pressure at the target and a higher reactive gas pressure at the substrate as taught by Sone because it allows for production of compound films with in-plane uniform thickness and optical and electrical.

Claims 20 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tadashi et al. in view of Sone as applied to claims 19 and 21 above, and further in view of Maniv et al. (U.S. Pat. 4,392,931).

Tadashi et al. is discussed above and teach applying power to the target and coil in the presence of only an inert gas to form a thin metal film. (See Tadashi et al. discussed above; Machine translation 0006) (Applies to claim 26)

The difference not yet discussed is the biasing of the substrate. (Claim 20)

Regarding claim 20, Maniv is discussed above and teaches rf biasing the substrate. (See Maniv discussed above)

The motivation for utilizing a bias to the substrate is that it allows for increasing transparencies of the deposited film. (Column 3 lines 43-59)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized an rf bias to the substrate because it allows for increasing the transparency of the film.

Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tadashi et al. in view of Sone and further in view of Maniv et al. as applied to claims 19, 20, 21 and 26 above, and further in view of Ngan (EP 840 351).

The differences not yet discussed are where the target is made of titanium, tantalum or tungsten (Claim 22) and where the coil is made of titanium, tantalum and tungsten (Claim 23).

Regarding claims 22 and 23, Ngan teach utilizing a target and coil made of titanium. (Column 12 lines 40-43)

The motivation for utilizing a target and coil made of a material such as titanium is that it allows for depositing a layer more uniformly. (Column 9 lines 5-8)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a target and coil made of titanium as taught by Ngan because it allows for depositing a layer more uniformly.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tadashi et al. in view of Sone as applied to claims 19 and 21 above, and further in view of Gilboa et al. (U.S. Pat. 5,108,569).

The difference not yet discussed is the use of a shield ring and shield support member. (Claim 24)

Regarding claim 24, Gilboa et al. teach a shield ring and shield support member in Fig. 2 such that when the shield ring is supported by the substrate support member a gas can be introduced to the upper surface of the substrate. (See Gilboa et al. Fig. 2)

The motivation for utilizing a shield ring and shield support member is that it allows for clamping the wafer to the substrate support. (Column 8 lines 37-38)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a shield ring and support member as taught by Gilboa et al. because it allows for clamping the wafer to the substrate support.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tadashi et al. in view of Sone as applied to claims 19 and 21 above, and further in view of Chikako et al. (Japan 06-041733).

The difference not yet discussed is the use of a central port for a reactive gas centrally disposed through a substrate holder. (Claim 25)

Regarding claim 25, Chikako et al. teach introducing reactive gas through the center of a substrate holder. (See Abstract; Figure 1)

The motivation introducing the reactive gas through the center of the substrate is that it allows for suppressing reaction products from building up on the surface of the target. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a reactive gas inlet at the center of the substrate holder as taught by Chikako et al. because it allows for suppressing reaction products from building up on the surface of the target.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tadashi et al. (Japan 10-324969) in view of Sone (U.S. Pat. 6,451,184), Ngan (EP 840 351) and Maniv et al. (U.S. Pat. 4,392,931).

Tadashi et al. is discussed above and all is as applies above. (See Tadashi et al. discussed above)

The differences between Tadashi et al. and the present claims is having a higher partial pressure of argon at the target than at the substrate, having a higher partial pressure of reactive gas near the substrate than at the target, the target made of titanium, tantalum or tungsten, the coil made of titanium, tantalum or tungsten and the substrate being biased.

Regarding claim 27, Since Tadashi et al. teach locating the argon proximate the target in Fig. 1 and locating the oxygen gas proximate the substrate in Fig. 1 the apparatus would have inherently higher partial pressures of argon proximate the target and higher partial pressures of oxygen proximate the substrate. (See Fig. 1) Sone further teaches partitioning the gas space such that reactive gas is contained between the partition member and the substrate and the sputter gas is maintained between the target and the partition member. This keeps the partial pressure of reactive gas higher at the substrate surface than at the target surface and keeps the partial pressure of argon gas higher at the target surface than at the substrate surface. (See Abstract) Furthermore, Sone recognizes that the prior art has attempted to keep the sputtering gas confined to the target and the reactive gas confined to the substrate. (Column 2 lines 17-22)

The motivation for utilizing a high sputtering gas pressure at the target and a higher reactive gas pressure at the substrate is that it allows for production of compound films with in-plane uniform thickness and optical and electrical characteristics. (Column 3 lines 22-25)

Regarding claim 27, Ngan teach utilizing a target and coil made of titanium. (Column 12 lines 40-43)

The motivation for utilizing a target and coil made of a material such as titanium is that it allows for depositing a layer more uniformly. (Column 9 lines 5-8)

Regarding claim 27, Maniv is discussed above and teaches rf biasing the substrate. (See Maniv discussed above)

The motivation for utilizing a bias to the substrate is that it allows for increasing transparencies of the deposited film. (Column 3 lines 43-59)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a higher partial pressure of argon at the target than at the substrate, to have utilized a higher partial pressure of reactive gas near the substrate than at the target as taught by Sone to have utilized a target made of titanium and coil made of titanium as taught by Ngan and to have utilized a biased substrate as taught by Maniv et al. because it allows for depositing a layer uniformly with desired optical and electrical characteristics with increasing transparency.

Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tadashi et al. (Japan 10-324969) in view of Sone (U.S. Pat. 6,451,184) and Takehara (U.S. Pat. 5,340,459).

Tadashi et al. is discussed above and all is as applies above. (See Tadashi et al.)

The difference between Tadashi et al. and the present claims is that having a high partial pressure of an inert gas inside the vacuum chamber proximate the sputtering target than at an upper surface of the substrate is not discussed and introducing a mixture of gas near the target and introducing a second gas near the substrate is not discussed.

Since Tadashi et al. teach locating the argon proximate the target in Fig. 1 and locating the oxygen gas proximate the substrate in Fig. 1 the apparatus would have inherently higher partial pressures of argon proximate the target and higher partial pressures of oxygen proximate the substrate. (See Fig. 1) Sone further teaches partitioning the gas space such that reactive gas is contained between the partition member and the substrate and the sputter gas is maintained between the target and the partition member. This keeps the partial pressure of reactive gas higher at the substrate surface than at the target surface and keeps the partial pressure of argon gas higher at the target surface than at the substrate surface. (See Abstract) Furthermore, Sone recognizes that the prior art has attempted to keep the sputtering gas confined to the target and the reactive gas confined to the substrate. (Column 2 lines 17-22)

The motivation for utilizing a high sputtering gas pressure at the target and a higher reactive gas pressure at the substrate is that it allows for production of compound films with in-plane uniform thickness and optical and electrical characteristics. (Column 3 lines 22-25)

Takehara teach a pipe 3 for introducing a mixture of gas near the target. Takehara teach a pipe 4 for introducing a second gas near the substrate. (See abstract)

The motivation for utilizing a mixture of gas near the target and a second gas near the substrate is that it allows for equalizing the reaction of a reactive gas with a target material above the surface of the target. (Column 1 lines 60-63)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Tadashi et al. by keeping the partial pressure of the inert gas higher at the target surface than at the substrate surface as taught by Sone et al. and to have introduced a mixture of gas near the target and a second gas near the substrate as taught by Takehara because it allows for producing uniform thin films and for equalizing the reaction of a reactive gas with a target material above the surface of the target.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tadashi et al. in view of Sone et al. and Takehara as applied to claims 28 and 29 above, and further in view of Maniv et al. (U.S. Pat. 4,392,931).

The difference not yet discussed is the biasing of the substrate.

Maniv is discussed above and teaches rf biasing the substrate. (See Maniv discussed above)

The motivation for utilizing a bias to the substrate is that it allows for increasing transparencies of the deposited film. (Column 3 lines 43-59)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized an rf bias to the substrate because it allows for increasing the transparency of the film.

Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tadashi et al. in view of Sone et al. and Takehara as applied to claims 28 and 29 above, and further in view of Ngan (EP 840 351).

The differences not yet discussed are where the target is made of titanium, tantalum or tungsten and where the coil is made of titanium, tantalum and tungsten.

Regarding claims 31 and 32, Ngan teach utilizing a target and coil made of titanium. (Column 12 lines 40-43)

The motivation for utilizing a target and coil made of a material such as titanium is that it allows for depositing a layer more uniformly. (Column 9 lines 5-8)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a target and coil made of titanium as taught by Ngan because it allows for depositing a layer more uniformly.

Response to Arguments

Applicant's arguments filed 11-25-05 have been fully considered but they are not persuasive.

In response to the argument that Tadashi et al. does not teach utilizing any other metal in their process, it is argued that Tadashi et al. while specifically mentioning aluminum (See machine translation paragraph 0006) contemplate other compound ingredients and other insulator layers (See Machine translation paragraph 0021). Ngan

was cited to teach that titanium can be used as a sputtering target. (Column 8) Ngan also recognize that aluminum can be used as a sputtering target (Column 9) Furthermore Ngan recognize that if a titanium target is utilized a compound film of titanium nitrogen can be formed. (Column 8 lines 45-55) Given that Tadashi et al. recognize other compound layers can be produced by their invention it would be obvious to utilize titanium to produce compound layers since Ngan recognize that a titanium target can be sputtered for production of compound layers. (See Tadashi et al. and Ngan discussed above)

In response to the argument that Ngan does not suggest introducing the gases as Applicant claims, it is argued that while Ngan is silent on gas introduction Tadashi et al. provide the teaching of gas introduction. (See Tadashi et al. and Ngan discussed above)

In response to the argument that the prior art of record does not teach introducing a first gas into a vacuum chamber wherein the first gas is introduced proximate a sputtering target disposed inside the vacuum chamber, wherein the sputtering target is made of a material selected from a group consisting of titanium, tantalum, and tungsten, applying power to the sputtering target and a coil disposed between the sputtering target and the substrate in the presence of only the first gas, and introducing a second gas into the chamber wherein the second gas is introduced proximate a surface of the substrate, it is argued that Tadashi et al. teach introducing a inert gas into a chamber proximate the sputter target and applying power to the target and coil depositing a thin metallic layer in the presence of only the inert gas.

subsequently a second reactive gas is introduced proximate the substrate to reactive with the metal to produce an insulating layer. (See Tadashi et al. paragraph 0006) Tadashi et al. also recognize additional compound films can be with their method (See Tadashi et al. Machine translation 0021) and Ngan recognize that a titanium target can be utilized to form compound films. (See Ngan discussed) Therefore, it would be obvious to modify Tadashi by utilizing a titanium film since both references are concerned with forming compound films. (See Tadashi et al. and Ngan discussed above)

In response to the argument that Tadashi does not teach pressure differences within its chamber, it is argued that since Tadashi et al. teach locating the argon proximate the target in Fig. 1 and locating the oxygen gas proximate the substrate in Fig. 1 the apparatus would have inherently higher partial pressures of argon proximate the target and higher partial pressures of oxygen proximate the substrate. (See Tadashi et al. Fig. 1)

In response to the argument that Sone does not teach pressure differences within the chamber, it is argued that Sone further teaches partitioning the gas space such that reactive gas is contained between the partition member and the substrate and the sputter gas is maintained between the target and the partition member. This keeps the partial pressure of reactive gas higher at the substrate surface than at the target surface and keeps the partial pressure of argon gas higher at the target surface than at the substrate surface. (See Sone et al. Abstract) Furthermore, Sone recognizes that

the prior art has attempted to keep the sputtering gas confined to the target and the reactive gas confined to the substrate. (See Sone et al. Column 2 lines 17-22)

In response to the argument that the prior art does not teach creating a higher partial pressure of an inert gas inside a vacuum chamber proximate a sputtering target disposed therein than at an upper surface of the substrate disposed in the vacuum chamber; initiating a plasma within the chamber; and creating a higher partial pressure of an active gas proximate the upper surface of the substrate than at the sputtering target, it is argued that since Tadashi et al. teach locating the argon proximate the target in Fig. 1 and locating the oxygen gas proximate the substrate in Fig. 1 the apparatus would have inherently higher partial pressures of argon proximate the target and higher partial pressures of oxygen proximate the substrate. (See Tadashi et al. Fig. 1) Furthermore, it is argued that Sone further teaches partitioning the gas space such that reactive gas is contained between the partition member and the substrate and the sputter gas is maintained between the target and the partition member. This keeps the partial pressure of reactive gas higher at the substrate surface than at the target surface and keeps the partial pressure of argon gas higher at the target surface than at the substrate surface. (See Sone et al. Abstract) Furthermore, Sone recognizes that the prior art has attempted to keep the sputtering gas confined to the target and the reactive gas confined to the substrate. (See Sone et al. Column 2 lines 17-22)

In response to the argument that biasing a coil and the substrate is not discussed, it is argued that Tadashi et al. suggest biasing the coil and the Maniv et al.

teach biasing the substrate for effecting the transparency of the film deposited. (See Tadashi et al. and Maniv et al. discussed above)

In response to the argument that the prior art does not teach creating a gap between a shield ring and a shield support member when the shield ring is supported by a substrate support member, wherein the shield ring, the shield support member and the substrate support member are disposed inside the vacuum chamber, and introducing active gas through the gap to the upper surface of the substrate, it is argued that Gilboa et al. teach a shield ring when supported by the substrate for introducing an active gas to the surface of the substrate. (See Gilboa et al. discussed above)

In response to the argument that the prior art does not teach introducing the active gas through an inlet port centrally disposed through a substrate support member configured to support the substrate, it is argued that Chikako et al. teach introducing gas through an inlet port centrally disposed through the substrate support member. (See Chikako et al. discussed above)

In response to the argument that nitrogen is not used to create the pressure differentials, it is argued that Tadashi et al. teach utilizing nitrogen to for film production and suggest creating pressure differentials as discussed above. (See Tadashi et al. discussed above)

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rodney G. McDonald

Rodney G. McDonald
Primary Examiner
Art Unit 1753

RM
1-5-06